

CLAIMS

The embodiments in which an exclusive property or privilege is claimed are defined as follows:

1. A captured nut and work-piece assembly comprising,;

an internally threaded fastener having a drive section, a first bearing surface, a work-piece receiving step extending from said first bearing surface, a second bearing surface at the end of said step and an axially extending collar extending from said second bearing surface and being coaxial with said step;

a work-piece having an aperture to receive said step and seat against said first bearing surface, said fastener having its drive section on one side of the work-piece and the collar extending to the opposing side of the work-piece, said work-piece about said aperture having a thickness less than the height of said step;

a washer having an aperture therethrough for receiving the collar, said washer having a proximate face seating said second bearing surface, said washer having a thickness greater than the height of said collar;

said washer having an interior facing wall about its aperture that has a radially extending section that is captured by said collar as it is deformed outwardly with said proximate face seated on said second bearing surface.

2. A captured nut and work-piece assembly as defined in claim 1

further comprising:

said interior facing wall being tapered radially outwardly from said proximate face to said distal face; and

said collar being swaged at an angle to abut against said tapered

interior facing wall.

3. A captured nut and work-piece assembly as defined in claim
further comprising;
said interior facing wall being angled approximately 70° from the
proximate face of the washer.

4. A captured nut and work-piece assembly as defined in claim
further comprising;
said interior facing wall having a radially extending ledge section
interposed between the proximate and distal faces of the washer and facing toward
said distal face;
said collar being crimped over said ledge within said aperture and its
axial confines to retain said washer.

5. A captured nut and work-piece assembly as defined in claim 1
further comprising;
said interior facing wall having a circumferential groove therein; and
said collar being deformed to intrude into said groove and retain
said washer.

6. A windage tray assembly for an internal combustion engine
comprising;
a plurality of internally threaded fasteners each having a drive
section, a first bearing surface, a windage tray receiving step extending from said

first bearing surface, a second bearing surface at the end of said step and a washer receiving collar extending from said second bearing surface and being coaxial with said step;

a windage tray having a plurality of apertures to receive said respective step and abut against said first bearing surface, said fastener having its drive section on one side of the windage tray and the collar on the opposing side of the windage tray, said windage tray about said aperture having a thickness less than the height of said step;

a washer having an aperture therethrough for receiving the collar, said washer having a proximate face abutting against said second bearing surface, said washer having a thickness greater than the height of the collar;

said washer having an interior facing wall about said aperture that has a radially extending section that is captured by said collar as it is deformed outwardly with said proximate face being seated on said second bearing surface;

7. A windage tray assembly as defined in claim 6 further comprising:

said interior facing wall being tapered radially outwardly from said proximate face to said distal face; and

said collar swaged at an angle to abut against said tapered interior facing wall.

8. A windage tray assembly as defined in claim 7 further comprising;

said interior facing wall being angled approximately 70° from the

proximate face of the washer.

9. A windage tray assembly as defined in claim 6 further comprising;

said interior facing wall having a radially extending ledge section interposed between the proximate and distal faces of the washer and facing toward said distal face;

said collar being crimped over said ledge within said aperture and its axial confines to retain said washer.

10. A windage tray assembly as defined in claim 6 further comprising;

said interior facing wall having a circumferential groove therein; and
said collar being deformed to intrude into said groove and retain said washer.